243102

SPECIALIZED PROFESSIONAL SERVICES, INC.

SPSI

24 HOUR SERVICE 1-877-228-SPSI

Safe Work Plan

For

Removal of Remaining VC

Car# OCPX80234
Vinyl Chloride, Stabilized (VC)

Conrail
Derailment Site Location
Mantua Creek Bridge
(near N.Commerce Street Crossing)
Paulsboro, New Jersey

Plan Review Date: 12/03/12
Prepared by: Drew McCarty - SPSI

TABLE of CONTENTS

Background, Scope, and Objective

A DOT105J300W tank car in Vinyl Chloride, Stabilized (VC) service was involved in a recent derailment accident and was punctured during the accident. The car was loaded when the accident occurred, and the resulting damages and incident conditions left the subject tank car with a large hole in it and approximately 3,000-5,000 gallons of a mixture of VC and water in its low end.

Operations performed thus far have been able to remove a large portion of the remaining VC and water mixture from the tank car, but site conditions limited the ability to remove 100% of that remaining material. Approximately 500-750 gallons of the VC and water mixture remains in the breached tank and will be safely managed through these next VC removal operations.

The scope of these next operations will expand, and provide an option for, tank car vapor controls. Furthermore, these operations will address the removal of the remaining VC and water mixture from the lowest point in the tank car; and lastly, the scope of this safe work plan will include field purging of the breached VC car.

The objective of these next operations is to remove remaining VC and from the car and get the car purged in preparation for wreck-clearing operations.

Status of the Breached VC Tank Car

The breached car is derailed off a railroad bridge and partially submerged into Mantua Creek. Another derailed car is in to the breached car, thus partially obstructing the breach opening for access.

Access to the breach in the car is limited to personnel approaching by boat on Mantua Creek.

The breached car contains approximately 500-750 gallons of VC and water mixture.

The car is resting securely against the bridge, wedged under an A-frame steel structure, and is pinned in place by the car that punctured it.

Pre-operational Preparations

Prior to executing these field operations, several pre-transfer preparations will take place. Such preparations will include the following:

- Preparation of a Job Specific Safe Work Plan (SWP)
- Review & Job Safety Briefing of this SWP with all crew members participating in these field operations.
- Deployment of site support equipment
- Deployment of vapor control equipment (secondary scrubbing system)
- Deploy Acetone transfer equipment

Each of these pre-transfer preparations is presented below.

Preparation of a Job Specific Safe Work Plan (SWP)

As this is a unique operation with unique hazards, this SWP has been developed to address safety and operational issues, Personal Protective Equipment (PPE), and contingencies associated with these field operations.

Personnel Operational and Job Safety Briefings

Prior to site work, all personnel will participate in a meeting that will review all aspects of this safe work plan including the incident background, site orientation, work plan scope and operational details, etc.

This SWP shall be presented and reviewed to ensure that all personnel working on this project understand the contents contained within this document and have all agreed to work within its framework.

Preparations of the Receiving Tank Cars

Six (6) "fresh" receiving tank cars are being prepared into a vacuum condition prior to their arrival at the work site. These cars under vacuum will be utilized to extract vapors from the breached tank car during these field operations.

Each of the receiving tank cars will be inspected as per FRA regulations and a pre-loading inspection checklist(s) shall be completed for each tank car. A post-loading checklist(s) will be completed as each car is buttoned up and properly secured for movement in transportation from the job site.

Verification of Site Support Equipment

Grounding fields were installed at the site and proven to less than 25 ohms resistance using an earth ground resistance tester.

A nitrogen tube trailer spotted near the work area will provide a bulk quantity of nitrogen that will also be utilized in support of these operations.

Light plant generators have been placed to enhance safety lighting.

Deployment of Vapor Control Equipment

As a back-up system to the six tank cars prepared to vacuum condition, a secondary vapor handling system shall be deployed. The secondary system will be deployed and valved into the system for use in the event the vacuum cars no longer function as needed.

This secondary system shall consist of a vacuum truck loaded with diesel fuel to serve as a primary vapor scrubbing solution. Vapors from the breached tank car will be pulled through the vacuum truck diesel fuel load, and diesel fuel will be used as the primary scrubber. The vacuum truck tank exhaust will be routed to polishing adsorber units loaded with potassium permanganate impregnated, granular activated carbon. Regular vapor phase carbon is not ideal for tank car vapor controls, but the potassium permanganate impregnated granular activated carbon units provide additional vapor controls in this application.

Acetone Transfer Equipment

The delivering tank trailer will be grounded to the grounding field(s) and bonded together with the damaged tank car to relax all static energy to ground and equalize all of the residual energies in each container. Painted and/or rusty surfaces on each container will be sufficiently removed to ensure continuity in each connection, and an ohms resistance tester will be utilized to prove that each connection has good contact.

Acetone Transfer Operations

The acetone transfer from the tank truck into the tank car will utilize nitrogen pressure (from the tube trailer) regulated into the highway tank trailer to control its transfer pressure and to chase the acetone liquid with nitrogen "sparging" as a mixing enhancement in the tank car at the end of the transfer.

The existing transfer hoses already deployed, leak tested, and proven to be leak free, shall be utilized for the acetone handling. The tie-in fittings and adaptors will be leak tested with nitrogen prior to the acetone transfer.

Air monitoring units shall be in operation throughout the transfer operations via the CTEH air monitoring program at this site.

One person will be assigned to the valves and flow control from the delivering highway tank trailer.

Personnel will also be assigned to two (2) of the other receiving tank cars to begin the operation, and as operational conditions evolve, those two technicians will be able to move from car to car in their assignments with the vacuum cars.

One person will be positioned at the breached tank car to monitor the liquid level in the car through the transfer and observe conditions inside the tank car.

One person will be a vacuum truck operator for the back-up vapor handling system.

In addition to the personnel assigned to the tank cars as noted above, one person shall control the nitrogen tube trailer supply, and the SPSI transfer manager shall direct the acetone transfer.

A minimum of eight (8) personnel will be staffed with specific duties facilitating this VC transfer operation. SPSI and Hepaco personnel shall cover this staffing requirement in this regard.

The acetone transfer into the tank car will utilize the existing transfer hoses and eduction pipe already in the tank car at the interface of the remaining liquid in the tank car. It is expected that the acetone transfer operation will create a whirlpool and blending effect inside the tank car, and that mixing will enhance these operations.

As conditions are presented and observed, the transfer manager may make field adjustments as needed to enhance mixing, etc.

During the acetone transfer, the vacuum tank cars shall be pulling vapors from the tank car interior via the tank car vapor line valve.

After the acetone transfer into the tank car has been achieved, the acetone and VC mixture will be transferred from the tank car back into the highway tank trailer.

Once this condition has been achieved, there will likely be another 500-700 gallons remaining in the bottom of the tank car at this point. Noteworthy is that the remaining solution in the tank car will be an acetone and VC mixture.

A smaller diameter hose(s) and fitting(s) can be deployed into the lowest point in the tank car at this point, and one of the tank cars in vacuum will be utilized to vacuum-extract the remaining 500-700 gallons of acetone/VC mixture to the extent possible from the breach access. The wreckage is currently prohibiting any better placement or extension of the existing 2" hose and fitting, but the use of a 1" set should have additional product removal success.

Once as much liquid has been removed to the extent possible, the tank car purging will continue to the tank cars in vacuum, and if/when those cars become in-effective, the secondary scrubbing system will be utilized to carry on purging. In addition to the six "fresh" tank cars in vacuum, there will be other tank cars being prepared into vacuum condition just in case another tank car "swap" would be needed to transition back from the vacuum truck and diesel scrubber solution.

Night security shall be provided to ensure no tampering of transfer equipment takes place.

Drips, Spills, and Contingency Safety Precautions

While this SWP has designed several safety elements into the prevention measures, we shall be prepared for any small or sudden failure within the system.

Potential failures from a risk management consideration include *small drips or leaks* from any flanged connection, threaded connection, the pump, or valves, *or a sudden failure* of any equipment component within the system.

Prevention measures that will be in place to not allow either of these scenarios to occur include the following components:

- Visqueen plastic will be deployed and bermed for the delivering tank truck to park on and serve as secondary containment for that tank truck.
- All transfer hoses, fittings, valves, nuts, bolts, and gaskets shall be in clean, pressure tested, compatible with acetone and VC, and ready for service condition. Any threaded connections (i.e. into tank car fittings) shall utilize Teflon rich thread sealing compound and Teflon thread sealing tape.
- The entire transfer system will be dried with nitrogen and pressure tested prior to the acetone and VC transfer to ensure that all components in the system are free from moisture and proven in tight condition.
- Isolation Valves are an integral part of this transfer system, and shut down valves shall be manually attended through the transfer to control acetone liquid and vapor flow. In the event of an emergency, each transfer personnel shall shut down his respective valve and/or equipment controls immediately.

If an emergency situation should occur during these transfer operations, there will be blasts on a designated fire department apparatus air horn to broadcast that signal to the entire site population, and everyone will be informed via the job safety briefing, where the egress route(s) is(are) and where the rally point is(are). The transfer manager will have direct radio communication with the on-scene fire department. The fire department has contingencies in place such as "reverse 911" to handle any evacuations if needed.

Fire department water application equipment is already in place at the site and can be rapidly implemented to address any vapor suppression or fire condition if such a condition would arise.

APPENDIX A

Personal Protective Equipment (PPE)

Task	Dermal	Respiratory
Working at Breach in tank	Nomex, Personal Floatation Device	SCBA
Boat Operations in Support of Breach Area Work	Nomex, Personal Floatation Device	SCBA
Transfer Operations Other Than the work near Breach	Nomex	Full Face, Air Purifying Respirators
Nitrogen Tube Trailer Technician	Nomex	Level D with APR on hand if conditions change